

**THE DATA COLLECTION SYSTEM AUTOMATIC PROCESSING SYSTEM  
(DAPS)  
DOMESTIC SATELLITE (DOMSAT) QUALITY MONITOR (DQM)  
USER INTERFACE MANUAL  
VERSION 2.0**

**January 1992**

**Prepared for:**

U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Environmental Satellite,  
Data and Information Service

**Prepared by:**

Integral Systems, Inc.  
5000 Philadelphia Way, Suite A  
Lanham, MD 20706  
ISI-52-104

**Contract #: 50-DDNE-7-00037**

**NOTE: This document was translated from a Wordstar diskette from the early 1990's.  
Hence, the pagination may not be as indicated in the Table of Contents**

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# 1. INTRODUCTION

This document provides the users of the Domestic Satellite (DOMSAT) Quality Monitor (DQM) with all information necessary to install, use, and maintain the system hardware and software. Section 1 provides an overview of the DQM purpose and functions. Section 2 describes the hardware setup and software installation for the DQM. Section 3 describes how to use all of the features of the DQM. Section 4 describes various maintenance tasks performed on the DQM.

## 1.1. Overview

The National Environmental Satellite, Data, and Information Service (NESDIS) manages, operates and maintains the U.S. Geostationary Operational Environmental Satellite (GOES) system. The GOES system's primary mission is to continuously observe changing weather phenomena from satellite based sensors situated approximately 23,000 miles from Earth. As a collateral duty, the GOES system supports a radio relay or Data Collection System (DCS). The DCS enables a large variety of environmental data to be relayed from point sources, Data Collection Platforms (DCP), which are land, sea, or mobile based through GOES and back to Earth, from where these data are disseminated to the various system users.

The DCS Automated Processing System (DAPS) was developed for the National Oceanic and Atmospheric Administration (NOAA) to support the increased volume and complexity of the DCS since its inception. The DAPS supports the receipt of messages from up to 100,000 platforms and can redistribute them to up to 5,000 users.

The primary means of data dissemination on the old DCS were telephone circuits. In the new DAPS this has been changed to a leased channel on a domestic communications satellite (DOMSAT). The DAPS is located at the NOAA Command and Data Acquisition (CDA) facility at Wallops Island, Virginia. From here platform messages are continuously broadcast using a subset of the X.25 protocol at 56,000 bits per second (56 Kbps). The data stream is received by the DOMSAT Quality Monitor (DQM), also at Wallops, where it is checked for completeness and transmission quality. The DQM will inform the DAPS of messages containing transmission errors so they can be automatically scheduled for retransmission.

Many users of the DCS will have a PC-based receiving station consisting of a satellite antenna, an industry-standard 386/PC running the UNIX(1) operating system, and custom software provided by the government. This receiving station is called the DOMSAT Receive Only Terminal (DROT). Figure 1-1 illustrates the data path from the DCP through the DAPS and to the user's DROT.

DCP messages are broadcast by the DAPS in a subset of the X.25 protocol. The protocol provides the DQM with a CRC check and sequence check for each incoming packet. Furthermore, each DCP message is transmitted with a 16-bit message sequence number which continually increments from one message to the next, wrapping around from 65,535 to 0. The DQM uses all of this information to check for CRC errors, missing X.25 packets, and missing DCP messages.

The DQM also receives a 56 Kbps message stream directly from the DAPS before uplink to DOMSAT. This direct message stream provides a means for the DQM to determine message outages and compute an estimated bit error rate (BER).

(1) UNIX is a trademark of AT&T.

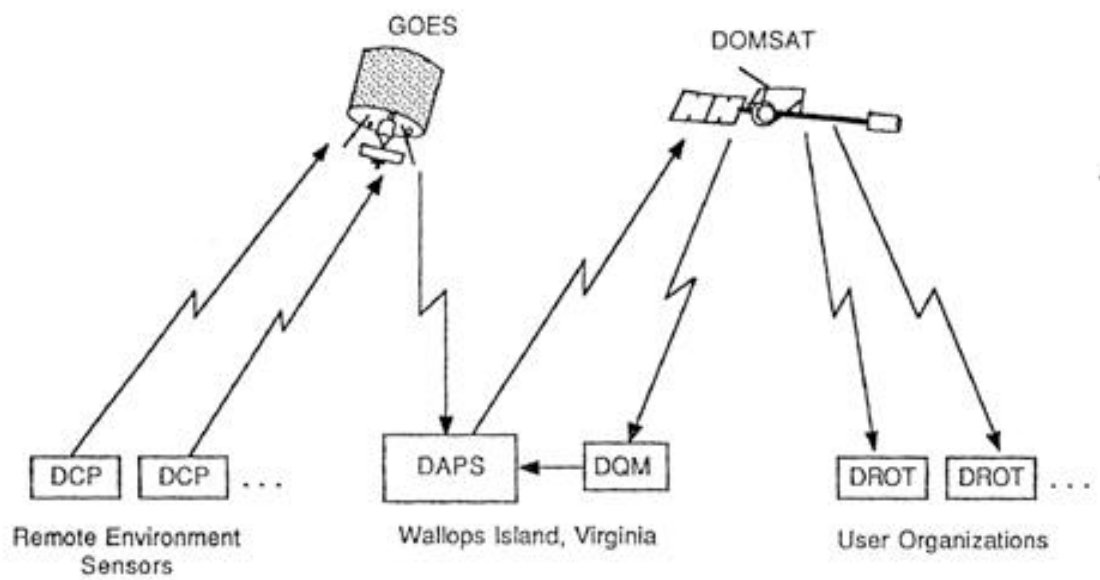


FIGURE 1-1: DATA PATH FROM DCP TO USER

Output from the DQM is connected directly to the DAPS via a serial line, operated asynchronously at 9600 baud. Through this serial line, the DQM sends the following three types of 'quality reports' to DAPS:

- o CRC Error Reports indicate that CRC errors were found on a contiguous range of messages. The first and last message sequence numbers of the range are included in the report.
- o Sequence Error Reports indicate that a contiguous range of DCP messages was missing or contained packet sequence errors. The first and last message sequence numbers of the range are included in the report.
- o Periodic Reports are sent once per minute to the DAPS. They include the message sequence number of the last good message received.

The exact format of these reports is given in appendix A.

## 2. INSTALLATION

This section describes the steps needed to set up and test the DQM components. First, the hardware components, setup, and diagnostics are described. Then an overview of the SCO UNIX installation process is given. Finally the installation of the custom DQM software is described.

### 2.1. DQM System Components

The DQM consists of the following components:

- o Industry Standard 386Computer (PC/AT/ISA bus)
- o At least 8 megabytes of RAM
- o One RS-232 serial port
- o One parallel printer port
- o One high-density (1.2 MB) floppy disk drive
- o Hard disk of at least 100 MB for 20 MB of DCPmessage storage (140 MB if Development System is installed)
- o Keyboard
- o Any standard video controller and monitor (HGC, CGA, EGA, or VGA)
- o Printer
- o \*2 Franklin Telecom ICP188C Communications Processors
- o \*\*SCO UNIX Operating System System V/386, Version 2.3
- o Satellite Antenna and Interface - COMSTREAM LDB and Receiver

\* Available from Franklin Datacom, 733 Lakefield Rd., Westlake Village, CA 91361, (805) 373-8688.

\*\* Available from The Santa Cruz Operation, Inc., 400 Encinal Street, P.O. Box 1900, Santa Cruz, CA 95061, (800) 626-8649.

### 2.2. DQM Hardware Setup

First set up the industry-standard 386 PC, monitor, keyboard, and printer according to the manufacturer's instructions. Power the system up and perform whatever hardware diagnostics were provided (There is usually a floppy disk labeled "System Checking" or "Diagnostic Checking" or something similar). There may also be separate diagnostic disks provided with the printer and video adapter.

Unpack the Franklin ICP188C communications boards. The boards should come with a loop-back connector and a floppy disk labeled "ICP188C Diagnostics, Version 2.42". Write down the serial numbers of the ICP188C boards about to be installed. They will be used later during the diagnostic checking.

Jumper settings on the jumper J2 must be set on both boards to select the base I/O addresses. One of the boards should function properly with the factory default jumper settings. Specifically, jumper pins 3-4,2-5, and 1-6 on jumper J2. This sets the base I/O address to 278H. Setting the I/O base address to this value will cause this board to be recognized as '/dev/icp' by the ICP device driver. The other board should be jumpered between 1-6 on jumper J2. This will set the base I/O address to 3B8H and will cause the board to be recognized as '/dev/icp1'. For further information on jumpering, refer to the Franklin ICP188C Technical Reference Manual supplied with the boards.

The software configures the board to use two 64KB shared memory windows starting at segment D000H and segment E000H. This is not currently configurable. This does not cause a problem on most standard 386 PC systems. However, if other third-party boards such as multi-port serial boards, ethernet adapters or other communications processors are used on the DQM, care should be taken to make sure there is no address conflict.

No interrupts are used for the ICP188C boards in the DQM software.

Read the computer manufacturer's instructions on installing expansion cards. Open the PC and install both ICP188C boards in adjacent 8 or 16 bit bus slots on the PC mother-board. Attach the loop-back connectors to the 37-pin sockets on the back of the ICP188C boards.

Also, while the PC case is open, see if there is a 'fault map' taped to the hard disk. If so, take it out. The fault map contains a list of bad tracks that the manufacturer found on your hard disk. This will be needed later when installing the SCO UNIX Operating System.

Boot MS-DOS on the PC and then place the Franklin diagnostic disk in the floppy drive and run them by typing:

**a:**  
**runme**

The program will offer a menu of four items, choose "**1. Run Diagnostic Tests**". You are then queried for the serial number(s) of up to four ICP188C boards which are installed. Type in the serial number of the ICP188C installed in this PC after the query for "Board 0". After the queries for other boards, just press **ENTER**.

Finally you are offered a menu of several tests which can be performed. Choose "**A - Test All Functions**". The tests should complete without reporting any errors. If errors are reported in the SCC Loopback or RS232 Signal tests, check that the jumpers are set in the proper positions given above and that the loop-back connector is securely fastened to the 37-pin socket on the back.

When the tests are complete, press **X** to exit the diagnostic program, then select option 4 to return to DOS. Remove the loop- back connector and store it in a safe place.

Connect the RS-232 connection which comes directly from the DAPS computers to the 37-pin socket on the back of the ICP188C configured as '/dev/icp'. Connect the RS-232 antenna interface from DOMSAT to the 37-pin socket on the back of the ICP188C configured as '/dev/icp1'.

## 2.3. SCO UNIX System V/386 Installation

If UNIX is being installed for the first time on your system, follow the installation instructions detailed in Chapter 2, Installation Guide, of the System Administrator's Reference. If the computer has been previously used for MS-DOS, first backup anything on the hard disk that you want to save. The UNIX Installation will destroy the entire contents of the hard disk.

There are two installation options: "Automatic" and "Configurable". Generally, you may choose the "Automatic" installation option, however if you intend to install other software or hardware products besides the DQM you may have to proceed through the "Configurable" installation. When using the "Automatic" installation all default values are acceptable. It is not recommended that a separate (/u) filesystem be

created. It is recommended that the "Relaxed Security" option be selected.

## 2.4. DQM Software Installation

UNIX provides a menu-driven utility for managing the system called '**sysadmsh**'. This utility must be run to create the dqm user account and install the DQM software. To run this utility login as root, giving the password that you supplied during the UNIX installation. When you get the shell prompt (#), type '**sysadmsh**' and press **Enter**.

First create the dqm account by selecting **Accounts** from the first menu; **User** from the second menu; then **Create** from the third menu. Enter 'dqm' for the username, any comments you desire and select 'yes' for 'Modify defaults' prompt which will bring up a new menu. The only default that must be modified is the Login Shell option. Specify 'csh' for that option. Press **Enter** to accept all other defaults when prompted. Upon exit of the default modification menu, you will be prompted for a password for the dqm account which will complete the creation of the dqm account. Additional information on setting up and administering user accounts may be found in the "Administering User Accounts" chapter of the System Administrator's Guide.

After creating the 'dqm' account, use the **Esc** key to return to the main menu of **sysadmsh**. To install the DQM software, select **System** from the main menu; **Software** from the next menu; then **Install** from the last menu. Press **Enter** to select **A New Product**, then **Enter** again to select the **Entire Product**. Place the installation disk in the disk drive and press **Enter** when prompted. When you are prompted for the first distribution volume just press **Enter**. The installation script will install the DQM software and the driver for the Franklin boards. It will then relink the Unix kernel. Answer 'yes' to all prompts after the kernel has been relinked. The DQM uses tty02 and tty03 for its displays. The installation procedure disables logins on these two multiscreens in order for the DQM to work.

After the installation has been completed, exit the **sysadmsh** utility by selecting the **Quit** option and **Esc** key to pop back up through the menus.

Finally, the system must be rebooted by entering **haltsys** in order to bring up the new version of UNIX.



### 3. DQM USER INTERFACE

This section describes the use of all features of the DQM. Sections 3.1 and 3.2 describe the startup and shutdown procedures respectively. Section 3.3 explains the DQM realtime status display. Section 3.4 explains how to view the DQM message log.

#### 3.1. Startup Procedure

To boot UNIX, power up the computer, monitor and printer. After the boot diagnostics are finished you will see the following prompt:

SCO System V/386

Boot  
:

Simply press **ENTER**. A screen-full of copyright and status information will then be displayed, followed by the prompt:

Type CONTROL-d to proceed with normal startup,  
(or give root password for system maintenance):

Press **CTRL-D** (Hold the **CTRL** key down and press **D**). The system then displays the current system time (local time) followed by the prompt:

Enter new time ([yymmdd]hhmm):

If the time is correct, just press **ENTER**. If the year, month, and day are correct but not the hour and minutes, enter the new hour and minutes in the format shown (HHMM), and press **ENTER**. Note that the hours are represented on a 24-hour clock. For example, if the correct time is five-thirty four PM, enter '**1734**' and press **ENTER**. If either the year, month, or day is incorrect, you must enter the complete time in the format YYMMDDHHMM. For example, if it is five-thirty four p.m. on February twenty- seventh, 1989, enter '**8902271734**' and press **ENTER**.

You will then see the UNIX login prompt which should look something like the following:

scosysv!login:

Log into the dqm account by entering 'dqm'. When prompted for the password, enter the previously selected password.

When you have successfully logged into the dqm account the system will display the C Shell prompt:

1%

To activate the DQM software enter:

1% dqm

After a brief pause, the following prompt will be displayed:

Enable DOMSAT Link (y/n)?

If you do not want to enable the link right away, type **n** and press **ENTER** (the link can be enabled later). Otherwise, type **y** and press **ENTER**. In either case, the following text will be displayed:

Press ALT-F2 for the DQM Status Display.  
Press ALT-F3 for the DQM Non-Realtime Functions.

The DQM software runs in a 'background' mode so you may continue to perform other tasks using UNIX commands while logged onto the dqm account.

### 3.2. Shutdown Procedure

It is important that the DQM and the UNIX system be shut down properly. **DO NOT SIMPLY TURN THE POWER OFF** as would be done if the computer were running MS-DOS. Doing so can damage the filesystem on the hard disk, and will require that the various fixup utilities be run when the system is next started. (See section 4.3. Recovering from an Improper Shutdown)

To shut the DQM software down, enter 'killdqm' while signed onto the dqm account.

To shut UNIX down, login as 'root' giving the password that you supplied during installation. When you get the shell prompt '#', type **/etc/haltsys** and press **ENTER**. You will then see the following message:

```

**   Normal System shutdown   **
                                     **
**       Safe to Power Off       **
                                     **
                                     -or-
**   Press any Key to Reboot   **
```

You may now power-down the monitor, printer and system unit.

If there are still problems restarting the DQM after an improper shutdown, check for the existence of the following files:

```

/usr/dqm/dqm_running
/usr/dqm/t_cfgkey
/tmp/scrout
/tmp/scrclock
```

These are temporary files which the DQM software creates when it is activated. These files are removed by the DQM software during normal shutdown. If they exist when the DQM software is inactive, they should be removed using the UNIX 'rm' command.

### 3.3. DQM Real-Time Status Screen

To view the real-time status screen, press ALT-F2 while the DQM is running. A sample status screen is shown in Figure 3-1.

The top line displays the current GMT and the version number of the software. The middle of the display is composed of four windows which contain information about the DAPS/DOMSAT links. The bottom three lines are used for the display of alarms.

GMT: 049 13:20:01    DOMSAT QUALITY MONITOR    Release 3.0.0 STATUS DISPLAY	
<div> <div>DAPS LINK</div> <div> Link Status: Disabled  Last Message In:  Bad Messages Today:    0 </div> </div>	<div> <div>DOMSAT LINK</div> <div> Link Status: Disabled  Last Message In:  Bad Messages Today:    0 </div> </div>
<div> <div>Last Reports Sent to DAPS</div> <div> P 03012  P 03103  P 03149  S 03157 03159 </div> </div>	<div> <div>DOMSAT Link Outages</div> <div> Current Outage Time:  Total Outages Today:  Outage Time Today:  Estimated BER:    0 </div> </div>
ALT-F1: UNIX Shell    ALT-F3: View Report Log    ESC: Change Configuration	

FIGURE 3-1: DQM REALTIME STATUS SCREEN

### 3.3.1. Dynamic Status Indicators

The screen body contains four windows which display dynamic information about the DAPS/DOMSAT links and a scrolling window of the most recent quality reports sent to DAPS. The following status indicators are included in the DAPS LINK and DOMSAT LINK windows:

- C "Link Status" - indicates the current status of the link. The status of the links can be one of the following:
  - "Disabled" - The link is currently turned off.
  - "Loading ICP" - The link was just activated and the communications program is being loaded onto the ICP188X communications processor.
  - "Active" - The link is receiving DCP messages.
  - "Timeout" - The link is activated but no messages have been received in the last 60 seconds. (The timeout period is actually a settable parameter.

See section 5 for instructions on how to change it.

- C "Last Message In" is the 16 bit sequence number of the last message received on the link. It should change approximately twice per second, continually increasing except for wrapping around from 65535 to 0.
- C "Bad Messages Today" is a tally of all messages received in the current day that had either a CRC or packet sequence error in them. At GMT 00:00:00 each day, the tally is written to the event log and then reset to zero.

The 'Last Reports Sent to DAPS' window is a scrolling window containing the ten most recent quality reports. There are three types of reports, explained fully in appendix A.

The 'DOMSAT Link Outages' window contains information about DOMSAT outages which have occurred during the current day. These fields are:

- C 'Current Outage Time' - This field will display the current amount of outage time (hh:mm:ss) if an outage is occurring. The occurrence of an outage is indicated by 'OUTAGE IN PROGRESS' being displayed in red on the line above. This field is reset to 00:00:00 at the termination of the outage.
- o 'Total Outages Today' - The total number of outages which have occurred this day.
- o 'Outage Time Today' - The total amount of time (hh:mm:ss) which has been lost to outages during this day.
- o 'Estimated BER' - The estimated DOMSAT BER (bit error rate) based on a comparison of the number of bytes contained for the same message received over both the DAPS and DOMSAT links.

### 3.3.2. DAPS/DOMSAT Links Activation

To activate the DAPS/DOMSAT links from the Status Display press **ESC**. A menu will pop up as

shown in Figure 3-2. Depending on whether the link is currently enabled or disabled, there will be a menu item labeled either "DOMSAT Link Enable" or "DOMSAT Link Disable". To change the link status move the highlighted cursor to this item using the arrow keys and press **ENTER**.

### 3.3.3. Acknowledging Alarms

Alarms are displayed in the three lines just above the keystroke menu near the bottom of the screen. There are two ways of acknowledging alarms. The simplest is just to press **F10**. The alternate method is to press **ESC** from the Status Display and then select '**Alarm Acknowledge**' from the menu.

### 3.3.4. Viewing the Quality Report Log

Every message that is sent to DAPS is also stored on disk in the Quality Report Log. This log is stored in two files called "dqm\_log.a", and "dqm\_log.b". When one file reaches its size limit, the DQM erases and starts using the other file. The number of lines in each file is specified as 10,000 in the "dqmconfig" file. Hence the most recent 10,000 log entries are guaranteed to be recorded.

To view the log, press **ALT-F3**. The screen will appear as shown in Figure 3-3. The log which is currently being written to is called the "Active Log", the other is called the "Backup Log". Choose a log to view by moving the highlighted cursor to it and press **ENTER**. The log will be displayed on the screen as shown in Figure 3-4.

From this screen you can scroll through the log line by line by using the up and down arrow keys. You can scroll a screen at a time by using the Page-Up and Page-Down keys. You can move directly to the beginning or end of the file by pressing the Home or End keys, respectively.

When finished viewing a log, press **ESC** to return to the menu.

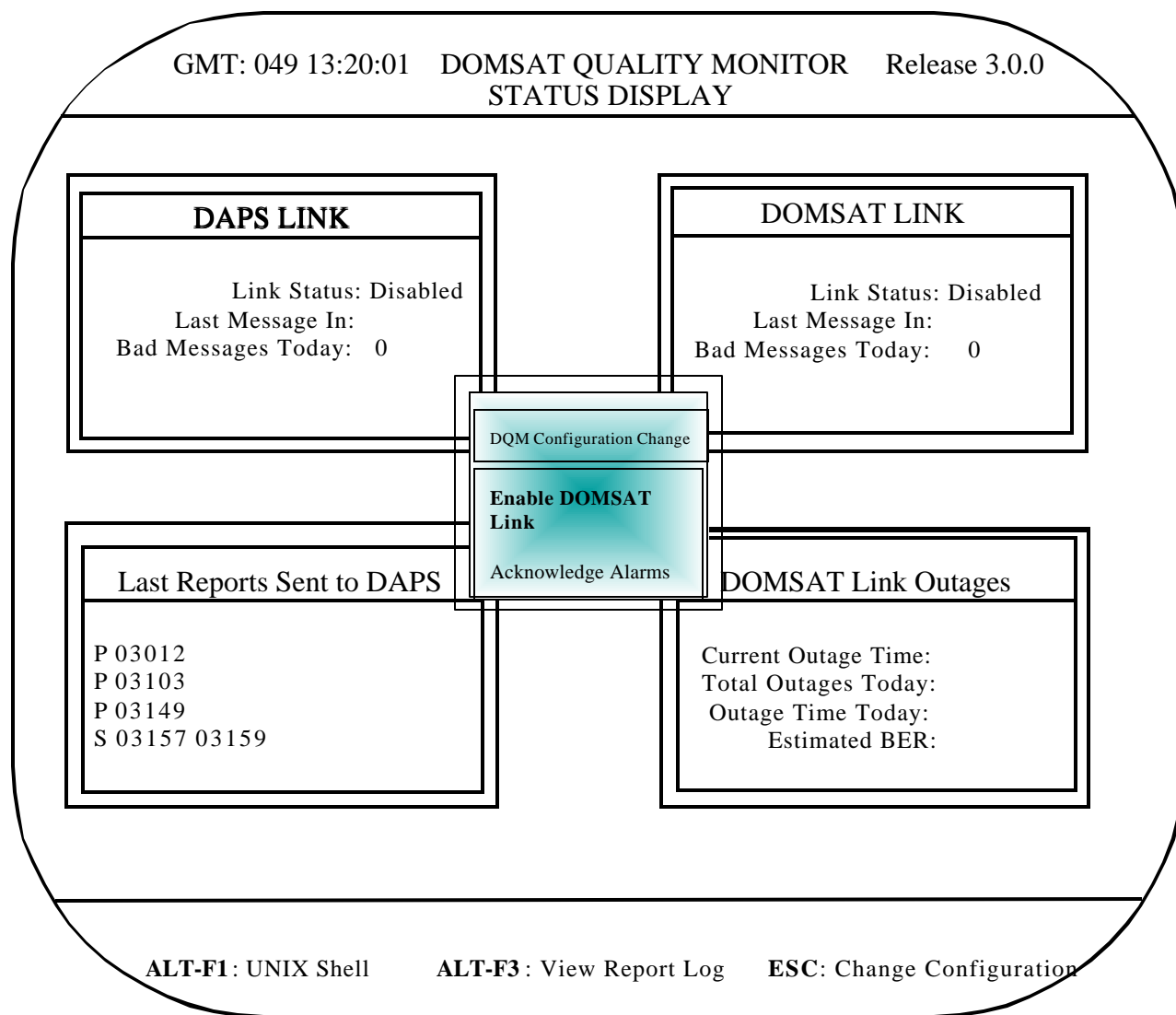


FIGURE 3-2: DQM ENABLE DOMSAT LINK / ACKNOWLEDGE ALARMS

GMT: 049 13:20:01	DOMSAT Link Status: Disabled	
<div><div><div><b>DQM REPORT LOG DISPLAY</b></div><div><div><b>Active Log</b></div><div>Backup Log</div></div></div></div>		
<b>ENTER:</b> Select	<b>ARROWS:</b> Move Selection	<b>ESC:</b> Abort

FIGURE 3-3 QUALITY REPORT LOG MENU

GMT: 049 13:20:01

DOMSAT Link Status: Disabled

```
049/13:10:01 P 10092
049/13:11:01 P 10115
049/13:12:01 P 10139
049/13:12:36 P 10158 10159
049/13:13:01 P 10164
049/13:14:01 P 10198
049/13:15:01 P 10222
049/13:16:01 P 10231
049/13:17:01 P 10258
049/13:18:01 P 10301
049/13:19:01 P 10346
049/13:20:01 P 10372
```

**ESC:** Quit    **UP/DOWN/PGUP/PGDN:** Scroll    **HOME:** File Start    **END:** File End

FIGURE 3-4 QUALITY REPORT DISPLAY



## 4. DQM MAINTENANCE

This section describes various maintenance tasks to be performed on the DQM. Section 4.1 explains the various parameters of the DQM, and how they can be changed. Section 4.2 describes the log kept by the DQM of various events and alarms. Section 4.3 explains how to use the DROT-prototype as a backup DQM.

### 4.1. DQM Configuration

When the DQM software is started it reads a file called "dqmconfig" in the current directory. This file contains the values of various parameters. The default configuration (as installed) is shown in Appendix B. You can change the configuration by simply editing this file.

**Note: You cannot edit the 'dqmconfig' file while the DQM is running!**

'dqmconfig' is an ASCII text file. You can use the text editor of your choice to modify 'dqmconfig'. UNIX comes with the VI, EX, and ED text editors. You will need to become familiar with one of these. Lines beginning with '#' are comment lines and are ignored. Blank lines are OK. Other lines begin with a parameter name followed by a colon, and then the parameter settings. The following is a brief explanation of the parameters.

**C      DAPS\_LINE: <device> <data-rate> <driver-mode>**  
**DOMSAT\_LINE: <device> <data-rate> <driver-mode>**

The 'device' is the filename of the UNIX device node. The nodes '/dev/icp' and '/dev/icp1' are created when the DQM is installed. As a result of the board installation procedure, '/dev/icp' should be used for the DAPS\_LINE and '/dev/icp1' should be used for the DOMSAT\_LINE. The data-rate is currently 56,000 Kbps for both lines. The 'driver-mode' should be 'DQM' for both boards. None of these parameters should be changed.

**o      DOMSAT\_TIMEOUT: <seconds>**

This specifies the number of seconds after which, if no messages are received over the DAPS/DOMSAT links, a timeout alarm will be generated. The default is 90.

**o      DAPS\_PROGRAM: <program-name>**  
**DOMSAT\_PROGRAM: <program\_name>**

These are the names of the programs which are downloaded to the Franklin Telecom ICP188X communications cards to handle the X.25 protocol of DOMSAT. Both should be set to 'bin/188x25.exe' at installation and should not be changed.

**C      DOMSAT\_DELAY: <seconds>**

This is the maximum propagation delay in seconds allowed between the DAPS/DOMSAT links before a message is marked as being missing.

**o      OUTAGE\_PERIOD: <seconds>**

This is the period (in seconds) in which two or more messages in error or missing will initiate an outage condition. Outage time is measured as the number of seconds elapsed between the receipt time of the first message in error and the last message in error during an outage condition. An outage condition is

considered to have concluded when OUTAGE\_PERIOD seconds have elapsed without any message errors.

- o **SERIAL\_LINE:** <device> <baud> <bits> <parity> <stop-bits>

This specifies the serial parameters used in communicating with the DAPS. The installation values set are device=/dev/tty1a, 9600 baud, 8 bits per character, no parity, 1 stop bit. None of these should be changed.

- o **RT\_TERMINAL:** <dev> <type> <init> <cons> <fore> <back>
- o **OL\_TERMINAL:** <dev> <type> <init> <cons> <fore> <back>

These lines specify the terminals to be used for the Real-Time Status Display and Quality Report Viewing functions when the DQM is running. 'dev' is the device name. 'type' is the type of terminal as specified in the termcap or terminfo databases. 'init' is an optional string sent to the terminal when the DQM is started up, which is useful for setting up colors and other attributes. It may contain control characters specified in exactly the same way as described above for MSG\_BEG and MSG\_END. 'cons' is a 1 if the terminal is one of the UNIX multiscreens and 0 otherwise. 'fore' and 'back' are the color numbers for normal foreground and background character display, as defined in the following table:

0	Black	8	Gray
1	Blue	9	Intense Blue
2	Green	10	Intense Green
3	Cyan	11	Intense Cyan
4	Red	12	Intense Red
5	Magenta	13	Intense Magenta
6	Brown	14	Yellow
7	White	15	Intense White

- o **ALARMCOLOR:** <foreground>

This specifies the color in which alarms are displayed on the CRT screen. Only the foreground color is specified. The background will be the same as the normal colors specified above.

- o **DQM\_LOG:** <log-name> <log-size>

This line specifies the name of the Quality Report Log. The log is actually stored in two files with ".a" and ".b" appended to the given name. The log-size is specified in number of lines.

- o **PERIODIC\_RPT:** <seconds>

This line specifies the number of seconds between each periodic report sent to DAPS.

## 4.2. The DQM Event Log

The DQM keeps two separate logs. The Quality Report Log described above contains all of the reports sent to the DAPS. The Event Log records events such as system startup and shutdown, DOMSAT enabling and disabling, and all errors and alarms. This section is concerned with the Event Log.

The event log is stored in two files called "errlog.a", and "errlog.b". When one file reaches its one-half megabyte size limit, the DQM erases the other file and starts using it. Hence the most recent half-meg of events is guaranteed to be recorded.

Each entry gives the date, time, name of the process generating the event, and a brief description of the event. The following is a sample of possible logged events:

```
Feb 3 15:54:58: q_ctrl: ===== DQM Starting up
Feb 3 15:56:30: q_ctrl: Enabling DOMSAT
Feb 3 15:57:25: q_ctrl: Disabling DOMSAT
Feb 3 15:58:40: q_ctrl: ===== DQM Shutdown
```

Note that the times stored in the log are in the local timezone, rather than GMT. Most of the entries are self explanatory and are generated as a direct result of some action taken by the user.

## APPENDIX A: DQM QUALITY-REPORT FORMATS

There are three types of quality reports sent from the DQM to the DAPS. All contain 21 ASCII characters, the last of which is a line feed. The three types of reports are as follows:

- o CRC Error Reports:

C \_ F F F F F \_ L L L L L \_ \_ T T T T T <LF>

- o Sequence Error Reports:

S \_ F F F F F \_ L L L L L \_ \_ T T T T T <LF>

- o Periodic Reports:

P \_ M M M M M \_ \_ \_ \_ \_ \_ \_ T T T T T <LF>

In the case of CRC and sequence error reports, 'FFFFF' and 'LLLLL' are the message sequence numbers of the first and last messages found to be in error, respectively. In the case of periodic reports, 'MMMMM' is the message sequence number of the last good (i.e. without error of any kind) message received by the DQM. 'TTTTT' is the number of seconds which have elapsed during the current outage; '0' if there is no outage in progress. 'TTTTT' is right-justified with leading blanks.

For example the report 'C 01096 01123' indicates that the messages with sequence numbers 1096 through 1123 (inclusive) were received with sequence errors. The DAPS will respond by queuing these message for retransmission.

There is a special case of periodic report where the sequence number is '99999' (which is **not** a valid message sequence number). This report indicates to the DAPS that the DQM is active but has not received **any** DCP messages yet. This happens when the DQM is first started up.

## APPENDIX B. DEFAULT DQM CONFIGURATION

The following is the DQM configuration file as provided in the installation floppy. For a description of the contents, see section 4.1.

```
#
# DQM Configuration File
#

#
# X.25 Parameters:
#
DAPS_LINE: /dev/icp 56000 DQM
DOMSAT_LINE: /dev/icp1 56000 DQM

#
# Timeout for X.25 Lines (DAPS and DOMSAT):
#
DOMSAT_TIMEOUT: 90

#
# Programs to download to ICP's:
#
DAPS_PROGRAM: bin/188x25.exe
DOMSAT_PROGRAM: bin/188x25.exe

#
# Maximum delay between DAPS/DOMSAT streams:
#
DOMSAT_DELAY: 3

#
# Period where > 1 errors indicates an outage:
#
OUTAGE_PERIOD: 175

#
# Serial Line Parameters:
#
SERIAL_LINE: /dev/tty1a 9600 8 even 1

#
# Real-Time Terminal:
#
RT_TERMINAL: /dev/tty02 ansi \033[2;1;7m\033[7;0;2m 1 1 7

ALARMCOLOR: 4

#
# Off-Line Terminal:
#
OL_TERMINAL: /dev/tty03 ansi \033[2;1;7m\033[7;0;2m 1 1 7
```

```
#  
# DQM DAPS Report Log File:  
#  
DQM_LOG: dqm_log 10000  
  
#  
# Seconds between periodic DAPS reports:  
#  
PERIODIC_RPT: 60
```

## **APPENDIX C. LIST OF ACRONYMS**

BCH	Bose, Ray-Chaudhuri, and Hocquengheim (an encoding scheme for DCP addresses)
CGA	Color Graphics Adapter
CRT	Cathode Ray Tube (display monitor)
DAPS	DCS Automatic Processing System
DCP	Data Collection Platform
DCS	Data Collection System
DOMSAT	Domestic Satellite
DQM	DOMSAT Quality Monitor
DROT	DOMSAT Receive Only Terminal
EGA	Enhanced Graphics Adapter
EISA	Extended Industry Standard Architecture
GMT	Greenwich Mean Time
GOES	Geostationary Operational Environmental Satellite
HGC	Hercules Graphics Card
KBPS	Kilobits per second
MB	Megabyte (1,048,576 bytes)
MS-DOS	MicroSoft Disk Operating System
NESDIS	National Environmental Satellite, Data and Information Service
NOAA	National Oceanic and Atmospheric Administration
PC	Personal Computer
RAM	Random Access Memory
SCO	Santa Cruz Operation
TBD	To Be Determined
VGA	Virtual Graphics Array